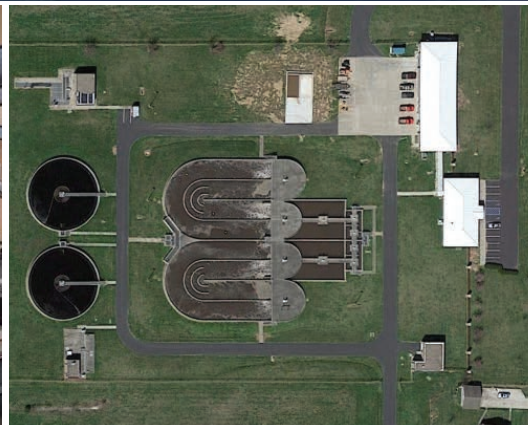


REGIONAL FACILITIES PLAN PLANNING PERIOD 2020-2040

JUNE 2020



MT. STERLING WATER & SEWER
MT. STERLING, KENTUCKY

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REGIONAL FACILITIES PLAN

MOUNT STERLING, KENTUCKY

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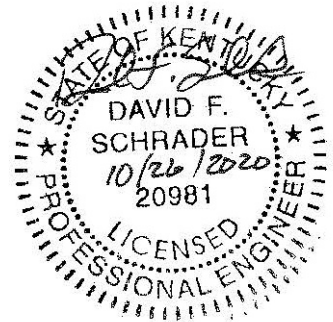


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Section 1 Executive Summary

SECTION 1 EXECUTIVE SUMMARY

A. Study Purpose

The facilities plan update is pursuant to 401 KAR 5:006 Section 2 and is being triggered by the need for the Mount Sterling Water and Sewer System (MSWSS) to expand the existing Hinkston Creek Wastewater Treatment Plant (WWTP) in the Hinkston Creek drainage area and expand its current collection service in the planning area. The purpose of this wastewater facilities plan is to define the most cost-effective, environmentally sound, and implementable treatment works which meet all applicable water quality standards and provides for the orderly expansion of the wastewater system for the City of Mount Sterling for the next 20 years. Focus will be given to addressing inadequate system or system components related to wastewater collection and treatment that have the potential to negatively impact water quality and/or public health in the planning area. The plan will provide guidance for the construction of sanitary trunk sewers, pumping stations, and treatment facilities with capacity to serve areas required to accommodate future population growth. The projected areas of growth include areas both within and contiguous to the present Mount Sterling corporate limits. The study will evaluate the combined effect of those three component analyses using the following guidelines:

1. *Cost-Effectiveness Analysis*-includes the comparison of alternatives to identify solutions which minimize total costs over time to meet the stated goals and objectives.
2. *Environmentally Sound Analysis*-includes evaluating each alternative with respect to the adverse effects on the natural environment.
3. *Implementation Analysis*-includes an evaluation of the capability and practicality of implementation of each alternative and selection of the alternative most capable of being implemented.

The plan will be beneficial to MSWSS for numerous reasons. The presence of trunk sewers opens areas for growth and development. The location of sewers will provide direction for the growth in the community, preserve the quality of area streams and impoundments, and minimize health and safety risks associated with on-site wastewater disposal systems (septic tanks).

SECTION 1 EXECUTIVE SUMMARY

B. Planning Scope

The planning activity undertaken as a part of this study is limited to the area within the boundaries of the planning area shown on Exhibit 3-1.

The planning process involves investigating and measuring, to the degree that information is available, the environmental conditions of the planning area; evaluating alternative wastewater facilities to meet forecasted growth; and evaluating the cost-effectiveness and environmental impact of each alternative as a part of the process of selecting the recommended plan.

The facilities plan includes the following elements:

1. A description of the treatment works for which construction drawings and specifications are to be prepared.
2. A description of the selected complete waste treatment system, of which the treatment works is a part.
3. Documentation of sewer system inflow/infiltration (I/I) with estimates for correction.
4. A cost-effectiveness analysis of alternatives for the treatment works and for the waste treatment system of which the treatment works is a part.
5. An identification of effluent discharge limitations.
6. An assessment of the expected environmental impact of the alternatives.
7. Required comments or approvals of relevant State, regional and local agencies, including compliance with OMB Circular A-95.
8. A summary of public meetings and hearings held during the planning process, including a summary of the views expressed.
9. A statement demonstrating that the authorities implementing the plan have the necessary legal, financial, institutional, and managerial resources available to ensure the construction, operation, and maintenance of the proposed treatment works.

SECTION 1 EXECUTIVE SUMMARY

A major constraint in the construction of a wastewater collection system is that “gravity” is used as the primary energy source. Sewers must, therefore, be designed and constructed with major consideration given to the drainage patterns and topography of the land.

C. Need

The most recent edition of the MSWSS Facility Plan was originally completed in January 1998 and updated in March 2000. Since that revision the planning area has experienced rapid growth particularly in the southwest and northeast regions of the planning area. The Hinkston Creek Wastewater Treatment plant is located approximately 3 miles northeast of downtown Mt. Sterling on Hinkston Pike. Currently the plant is operating at 2.53 mgd or 84 percent of the rated capacity of 3.0 mgd. Organic loading has increased dramatically over the years due to industrial contributions. The facility was designed to treat 215 mg/l at a design flow of 3.0 mgd for a total design load of 5,379 lbs/day. The current organic loading relative to Biochemical Oxygen Demand averages around 300 mg/l for a total organic loading of 7,506 lbs/day or 140 percent of design capacity. In addition to the plant, several portions of the existing collection system have become increasingly problematic and are prone to heavy sources of inflow and infiltration. Part of the work moving forward for the MSWSS will be to conduct sanitary sewer evaluation surveys (SSES) and rehabilitation in the suspect areas in an attempt of quantifying problems and pinpointing areas to correct.

Deteriorating systems and capacity issues are not the only basis of need. The planning area has experienced increases in population; an expansion of retail, commercial and industrial businesses; and improvements to non- wastewater infrastructure. Growth along Hinkston Pike and the surrounding area is expected to increase flows well in excess of the rated capacity of the existing facility. These positives warrant a need for expansion of the system. Demographics and projections will be discussed in subsequent Sections.

Finally, constraints of the natural environment and human environment to include topography, soils and surface waters create a need for the facilities plan update. The purpose of this report is to allow for improvement and expansion of the current system in a manner that is functional within the restraints and the conditions imposed by the surrounding environment.

SECTION 1

EXECUTIVE SUMMARY

D. Selected Alternatives

The recommendations in this Regional Facilities Plan include upgrades to the collection system and treatment systems within the planning area in order to provide adequate capacity for current and future growth. The collection system alternatives include line extensions, pump station upgrades and rehabilitation projects.

1. Sanitary Sewer Rehabilitation

The existing wastewater collection system has adequate capacity to convey the projected future average daily flows for the improvements identified in this facilities plan. However, from Section 7, it is concluded that inflow/infiltration (I/I) to the Hinkston Creek WWTP is excessive. Since the last upgrade of the treatment facility the plant has been successful in meeting their effluent limits at all points. Mount Sterling is pro-active in the management of the City wastewater facilities and this performance emphasizes that MSWSS acts expediently to implement cost-effective enhancements to the system, including I/I control.

2. Sanitary Sewer Rehabilitation Program

To pinpoint where excessive, I/I exist, the MSWSS has developed a Sanitary Sewer Rehabilitation Program. Flow monitoring will be conducted on each watershed to identify high I/I locations. The rehabilitation program includes the following phases:

- a. Phase 1–Perform Flow monitoring in I/I sewer sheds.
- b. Phase 2–Identify and rank sewer sheds based on I/I levels.
- c. Phase 3–Perform a physical survey of manholes in sewer shed #1.
- d. Phase 4–Perform a physical survey of pumping stations in sewer shed # 1.
- e. Phase 5–Hydraulic jet and mechanical cleaning of known high I/I areas.
- f. Phase 6–TV Inspection & Smoke Testing
- g. Phase 7–Identify rehabilitation projects.
- h. Phase 8–Perform rehabilitation work.
- i. Phase 9–Move to the next highest I/I sewer shed and repeat until all sewer sheds have been rehabilitated.

SECTION 1

EXECUTIVE SUMMARY

3. Collection System Improvements

Collection System improvements for future developments are beyond the scope of this plan, as it is presumed these would be installed by the owners/ developers of the benefited property. The potential exists that some areas could develop prior to construction of the trunk facilities proposed in this plan necessitating the construction of facilities with limited capacities to pump back into the existing system on an interim basis. Should interim facilities be required, they would either be incorporated into the plan or abandoned once the trunk facilities in this plan have been constructed. Therefore, limited capacity interim facilities should not be considered to be in conflict with this plan.

4. Wastewater Treatment Plants

a. Hinkston Creek WWTP

Selected Alternate-Oxidation Ditches

As described in previous sections of this report, the existing Hinkston Creek WWTP utilizes two (2) oxidation ditch enhanced biological nutrient removal (EBNR) systems and two (2) clarifiers for secondary treatment of wastewater. This alternative would add one (1) EBNR systems and one (1) additional clarifiers to bring the rated capacity of the treatment system to 6.0 mgd ADF and 16.0 mgd PDF. Nutrient removal would be accomplished primarily by the EBNR process with backup metal salt chemical feed systems. The existing chemical feed system is sized to handle the additional flows.

This alternative could be easily implemented since the piping associated with these improvements and the grading has already been completed with the construction completed in 2000. The proposed improvements include new influent pumps rated at 3 mgd each, a third screen, an influent and effluent splitter box, one EBNR oxidation ditch, a new clarifier, upgraded UV disinfection and solids processing improvements. A detailed opinion of probable project costs can be found in Section 8 of this report and a summary can be found in table 1-1.

SECTION 1 EXECUTIVE SUMMARY

E. Summary of Project Costs

**TABLE 1-1
OPINION OF PROBABLE PROJECT COSTS
FOR PHASED IMPROVEMENTS**

DESCRIPTION	0-2 YEARS	3-10 YEARS	11-20 YEARS
1. Wastewater Treatment Plants			
a. Hinkston Creek WWTP	\$12,320,000		
2. Southeast Quadrant Sewers			
Harpers Creek Outfall Sewer			\$1,814,000
Spencer Creek Outfall Sewer			\$5,196,000
Sub-Total Southeast Quadrant	\$12,320,000	\$0	\$7,010,000
3. Southwest Quadrant Sewers			
Outfall Sewer to Hinkston Creek Trunk			\$2,721,000
Reid Village Sewers		\$2,819,000	
Autumn Ridge Sewers		\$1,045,000	
Sub-Total Southwest Quadrant Sewers	\$0	\$3,864,000	\$2,721,000
4. Northwest Quadrant Sewers			
North Ridge/ Grand Prairie Sewers		\$884,000	
Sub-Total Northwest Quadrant Sewers	\$0	\$884,000	\$0
5. Northeast Quadrant Sewers			
Fox Chase Sewers		\$879,000	
Sub-Total Northeast Quadrant Sewers	\$0	\$879,000	\$0
6. Sanitary Sewer System Rehabilitation	\$180,000	\$250,000	\$250,000
TOTALS	\$ 12,500,000	\$ 5,877,000	\$ 9,981,000

Note: The MSWSS will endeavor to implement these projects as the community expands, however, if growth does not match the expected timelines, some projects may be delayed until funds are available.

SECTION 1 EXECUTIVE SUMMARY

F. Impacts on the Environment

Cross-cutter letters were sent to various state and federal agencies to determine if the selected alternatives would have an adverse impact on the environment. Responses from these agencies indicated that the proposed projects will not have any negative impact on floodplains, wetlands, air quality, ground water, surface water, threatened or endangered species, farm land, historical or archaeological sites. However, the State Historic Preservation Office (SHPO) requested that all areas that have not been previously surveyed, be surveyed by a qualified professional archaeologist and that a report of the investigation be sent to their office for review. A survey of the project locations will be conducted prior to any construction activities and the results of that survey will be sent to SHPO for review.

G. Institutional Responsibilities

The City of Mount Sterling has a city commission form of government consisting of six members with a mayor presiding. The administration of day-to-day city affairs is conducted by the mayor and the council. Day to day operations of the wastewater system is managed by the Mount Sterling Water and Sewer Board, whose members are appointed by the mayor, acting through the Mount Sterling Water and Sewer System (MSWSS). Mount Sterling has the legal authority, and will be the only local government entity involved in the planning, financing, construction and operation of the proposed facilities.

The selected plan, as set forth in this facilities management plan, will be implemented by the City of Mount Sterling. Chapter 94 of the Kentucky Revised Statutes provides for sewerage facilities within and outside the corporate limits. Chapter 82 of the Kentucky Revised Statutes provides authorization for cities to finance public improvements through the issuance of either general obligation or revenue bonds.

H. Funding Plan

The purpose of this section is to develop a preliminary funding plan for the implementation of the improvements described above and in detail in Section 8 of this report. This will require significant capital along with funding/financing to be successfully implemented. A multi-phased approach is recommended over the next 20 years totaling \$28,608,000 segmented into the 0-2 year, 3-10 year and 11-20 year phases.

SECTION 1 EXECUTIVE SUMMARY

Phase 1 (0-2 Year)	-	\$12,500,000
Phase 2 (3-10 Year)	-	\$5,877,000
Phase 3 (11-20 Year)	-	\$9,981,000

This funding plan is based on the opinion of probable project costs and O&M costs outlined in Section 8 of this report. A large portion of the money required to fund these projects will be acquired through the issuance of Revenue Bonds and/or obtaining a Government Loan through the Kentucky Infrastructure Authority (KIA), Clean Water SRF Program. MSWSS has been successful in obtaining KIA SRF low-interest loans and will continue to pursue the most economically sound funding/finance options available.

It should be noted that the calculations presented in this section are based upon preliminary numbers, these calculations will be adjusted after actual construction costs are known through the bidding process. This section is intended to provide an order of magnitude of projected user charge increase for use in the planning process. The MSWSS will endeavor to implement these projects as the community expands, however, if growth does not match the expected timelines, some projects may be delayed until funds are available.

5. Funding Options

There are several funding options that will need to be evaluated including State Revolving Fund (SRF) Loans through the Kentucky Infrastructure Authority (KIA), General Obligation Bonds and Revenue Bonds.

a. SRF Loans

The Federally Assisted Wastewater Revolving Loan program, or Fund A, is a loan program administered through KIA. The standard rate is 2.5 percent and the non-standard rates are 1.5 percent and 0.5 percent for the period July 1, 2019, to June 30, 2020. (Rates are adjusted at least annually.) To qualify for the 0.5 percent hardship rate, the community's median household income must be below \$37,228 (80 percent of the MHI of the Commonwealth). To qualify for the 1.5 percent non-standard rate, the borrower must have a MHI between \$46,535 and \$37,339 (80 percent of the State MHI). Mount Sterling has an MHI of \$41,108 so they will qualify for an interest rate of 1.5 percent. A loan servicing fee of 0.2 percent of the unpaid balance will be due annually.

SECTION 1

EXECUTIVE SUMMARY

1) 20 Year Term

The KIA offers a 20 year loan payback program. The loan process requires 20 percent debt service coverage and loan payback at current market rates.

2) 30 Year Term

A second option would be a 30 year loan payback program. The loan process requires 20 percent debt service coverage and loan payback at current market rates.

b. Municipal Bonds

States, counties and cities that seek financing for public projects may issue municipal bonds. By issuing these debt securities, the government is borrowing money from the public. The bondholders will be repaid the principal plus interest over a specific span of years. The two types of municipal bonds are general obligation bonds and revenue bonds. The difference between them lies in how the government issuer secures the money to repay the bondholders.

1) General Obligation Bonds

General obligation bonds are securities guaranteed by the “full faith and credit” of a government with taxing power. These bonds typically are used to finance capital improvement projects such as streets, roads and public buildings. With these bonds, the state or local government bond issuer pledges to use its general taxing power to repay the bondholders. Because these bonds place a general obligation on all taxpayers to cover bond repayments, the voters of a state or local government typically must approve general obligation bonds before they are issued.

2) Revenue Bonds

Revenue bonds are repaid from the revenues generated by the project the bonds financed. These bonds finance revenue-producing projects such as industrial parks, toll roads, convention centers, sports stadiums or water and sewer utilities. Projects may generate

SECTION 1 EXECUTIVE SUMMARY

revenues through things like user fees, admission charges, rents or lease payments, or concession fees. In most instances, revenues from the project go into a revenue fund from which operating expenses and bond repayments are drawn.

I. Impact on User Charges

1. User Rates

The table below shows the current user rates for customers inside and outside the City limits:

**TABLE 1-2
CURRENT USER RATES
Effective 7/1/2019**

USAGE AMOUNT	CITY RATE	COUNTY RATE
First 748 gallons	\$9.76 minimum	\$10.24 minimum
Next 4,488 gallons	\$5.04 per 1,000 gallons	\$5.95 per 1,000 gallons
Next 9,724 gallons	\$4.35 per 1,000 gallons	\$5.09 per 1,000 gallons
Excess (Over 14,960 gallons)	\$3.80 per 1,000 gallons	\$4.48 per 1,000 gallons

Inside City Rate for 4,000 gallons per month = \$ 26.15

Outside City Rate for 4,000 gallons per month = \$ 29.59

Revenue generated from these user rates in 2019 totaled \$2,330,660. The following is a summary of the Sewerage Departments financial condition from the annual audit:

The Sewerage Department's operating revenue increased by approximately \$106,260 or 4.8 percent over last year while the operating expenses increased by approximately \$36,815 or 2.3 percent. **This resulted in an increase in net operating income of approximately \$69,445 over last year.** The increase in operating expenses is due to staff increases and chemical costs. Net non-operating revenue (expense) decreased by approximately \$38,643 from the prior year. The total change in net position increased by approximately \$108,088 or 18.6 percent over the prior year.

SECTION 1

EXECUTIVE SUMMARY

2. Required Revenue

a. KIA 20 Year Loan

The selected alternatives for the 0-2 year planning period include approximately \$12,500,000 worth of improvements. At an interest rate of 1.5 percent and a term of 20 years, the annual impact to user rates would require approximately \$ 643,320 in revenue to cover the loan payment and the 0.2 percent loan servicing fee. Adding the 10 percent debt service coverage brings the total annual revenue requirement to \$707,652. However, in 2024 the current 2003 KIA Fund A loan will be paid off, freeing up \$661,211 in principal and interest payments reducing the increased revenue requirement to \$46,441 or 2 percent of sewer revenues. As indicated by the KIA Executive Summary, it is not anticipated that a rate increase will be necessary as long as revenue and expenses remain steady.

b. KIA 30 Year Loan

KIA Fund A loans with a 30-year term are only available to communities with an MHI that is less than 80 percent of the Kentucky MHI of \$46,535. Mount Sterling has an MHI of \$41,108, therefore a 30-year term is not available for these projects.

3. Required User Rates

- a. As indicated previously, it is not anticipated that a rate increase will be required for the construction of the 0-2 year projects.

SECTION 1
EXECUTIVE SUMMARY

J. Implementation Schedule

TABLE 1-3
PRELIMINARY IMPLEMENTATION SCHEDULE

TASK	DUE DATE
Submit Draft to KYDOW for Comment	July 2020
Public Hearing	August 2020
Approval of Facilities Plan by MSWSS	July 2020
Submit Final Plan to KYDOW for Approval	July 2020
Approval of Plan by KYDOW	August 2020
Preliminary Design of Improvements	June-August 2020
Final Design of Improvements	August-November 2020
Submit Plans to KYDOW	December 2020
Approval of Design by KYDOW	January 2021
Advertisement for Bids for Improvements	March 2021
Receive Bids	April 2021
Award Construction	May 2021
Construction	June 2021-June 2022

Section 2 Statement of Purpose and Need

SECTION 2

STATEMENT OF PURPOSE & NEED

A. Study Purpose

The facilities plan update is pursuant to 401 KAR 5:006 Section 2 and is being triggered by the need for the Mount Sterling Water and Sewer (MSWSS) to expand the existing Hinkston Creek Wastewater Treatment Plant (WWTP) in the Hinkston Creek drainage area and expand its current collection service in the planning area. The purpose of this wastewater facilities plan is to define the most cost-effective, environmentally sound and implementable treatment works which meet all applicable water quality standards and provides for the orderly expansion of the wastewater system for the City of Mount Sterling for the next 20 years. Focus will be given to addressing inadequate system or system components related to wastewater collection and treatment that have the potential to negatively impact water quality and/or public health in the planning area. The plan will provide guidance for the construction of sanitary trunk sewers, pumping stations, and treatment facilities with capacity to serve areas required to accommodate future population growth. The projected areas of growth include areas both within and contiguous to the present Mount Sterling corporate limits. The study will evaluate the combined effect of those three component analyses using the following guidelines:

1. *Cost-Effectiveness Analysis*-includes the comparison of alternatives to identify solutions which minimize total costs over time to meet the stated goals and objectives.
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The plan will be beneficial to MSWSS for numerous reasons. The presence of trunk sewers opens areas for growth and development. The location of sewers will provide direction for the growth in the community, preserve the quality of area streams and impoundments, and minimize health and safety risks associated with on-site wastewater disposal systems (septic tanks).

B. Planning Scope

The planning activity undertaken as a part of this study is limited to the area within the boundaries of the planning area shown on Exhibit 3-1.

SECTION 2

STATEMENT OF PURPOSE & NEED

The planning process involves investigating and measuring, to the degree that information is available, the environmental conditions of the planning area; evaluating alternative wastewater facilities to meet forecasted growth; and evaluating the cost-effectiveness and environmental impact of each alternative as a part of the process of selecting the recommended plan.

The facilities plan includes the following elements:

1. A description of the treatment works for which construction drawings and specifications are to be prepared.
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9. A statement demonstrating that the authorities implementing the plan have the necessary legal, financial, institutional, and managerial resources available to ensure the construction, operation, and maintenance of the proposed treatment works.

SECTION 2

STATEMENT OF PURPOSE & NEED

A major constraint in the construction of a wastewater collection system is that “gravity” is used as the primary energy source. Sewers must, therefore, be designed and constructed with major consideration given to the drainage patterns and topography of the land.

C. Need

The most recent edition of the MSWSS Facility Plan was originally completed in January 1998 and updated in March 2000. Since that revision the planning area has experienced rapid growth particularly in the southwest and northeast regions of the planning area. The Hinkston Creek Wastewater Treatment plant is located approximately 3 miles northeast of downtown Mt. Sterling on Hinkston Pike. Currently the plant is operating at 2.53 mgd or 84 percent of the rated capacity of 3.0 mgd. Organic loading has increased dramatically over the years due to industrial contributions. The facility was designed to treat 215 mg/l at a design flow of 3.0 mgd for a total design load of 5,379 lbs/day. The current organic loading relative to Biochemical Oxygen Demand averages around 300 mg/l for a total organic loading of 7,506 lbs/day or 140 percent of design capacity. In addition to the plant, several portions of the existing collection system have become increasingly problematic and are prone to heavy sources of inflow and infiltration. Part of the work moving forward for the MSWSS will be to conduct extensive Sanitary Sewer Evaluation Surveys (SSES) and rehabilitation in the suspect areas in an attempt of quantifying problems and pinpointing areas to correct.

Deteriorating systems and capacity issues are not the only basis of need. The planning area has experienced increases in population; an expansion of retail, commercial and industrial businesses; and improvements to non-wastewater infrastructure. Growth along Hinkston Pike and the surrounding area is expected to increase flows well in excess of the rated capacity of the existing facility. These positives warrant a need for expansion of the system. Demographics and projections will be discussed in subsequent Sections.

Finally, constraints of the natural environment and human environment to include topography, soils and surface waters create a need for the facilities plan update. The purpose of this report is to allow for improvement and expansion of the current system in a manner that is functional within the restraints and the conditions imposed by the surrounding environment.

Section 3 Physical Characteristics of the Planning

SECTION 3

PHYSICAL CHARACTERISTICS OF THE PLANNING AREA

A. Planning Area

The City of Mount Sterling is located approximately 35 miles east of Lexington, and 95 miles west of Ashland, Kentucky. The proposed planning area is a contiguous boundary around the City of Mount Sterling along the Interstate 64 (I-64) corridor located in Montgomery County, Kentucky. The major metropolitan area located within the boundary of the planning area is the City of Mount Sterling.

The planning area is approximately 38,530 acres. The northern boundary of the planning area follows I-64 from mile point 108 in the west and generally runs west to east approximately 1 mile north of I-64 to a mile point 113 to the east. The western boundary of the planning area runs north to south from Paris Pike (KY 460) to a point just south of the community of Prewitt. The southern portion of the western boundary follows a southeasterly bearing approximately 1 mile north of Tonkin and Whitaker Road and terminates at Spencer Road. The eastern boundary of the planning area is similar to the western boundary in that it typically runs north to south. The western boundary of the planning area runs from Spencer Road north to a point along I-64 around mile point 113. The 20-year planning boundary includes portions of the Hinkston Creek, Somerset Creek and Spencer Creek watersheds.

1. Key Topographic Features

The terrain in the planning area is considered gently rolling with elevations ranging from 816 feet to 1051 feet above mean sea level. Most of the land has been cleared of timber and extensively used for farming and general use agricultural purposes. The watersheds in the county generally flow from south to north. The planning area boundary includes areas of watersheds that can gravity flow allowing for economical construction of sanitary sewer services. This area includes the headwaters of the Hinkston creek watershed located south of the city limits along Levee Road to a point just south of Tonkin Road. In addition, the northern part of the county includes an area along Hinkston Pike that can be served by gravity sewers near the Hinkston Creek WWTP.

2. Key Geographic Features

Geographic features can be divided into two categories, physical features and man-made features.

SECTION 3

PHYSICAL CHARACTERISTICS OF THE PLANNING AREA

a. Physical/Natural Features

Montgomery County has a diverse physical geography. The varying geology in the region helps contribute to the diversity. The key geologic features in the northern portion of the planning area are the Somerset Creek and Hinkston Creek watersheds. The key geologic feature in the central portion of the planning area is the unique clay and mineral deposits. The southern portion of the planning area is on the edge of Slate Creek.

The varying landforms also contribute to the unique geography in the planning area. As previously discussed, the planning area can generally be classified as hill country.

In addition to geology and landforms, the diverse soils in the planning also help characterize the geography of the region. The Soil Conservation Service, U.S. Department of Agriculture, completed a soil survey of the area in 1982. The report and survey list the soils found in the planning area.

Generally, the soils in the area are representative of the Outer Bluegrass and the Knobs Region. The Outer Bluegrass Region is the area north of Mount Sterling and the Knobs Region are found in the hillier southern portion of the planning area.

Another contributor to the diverse physical geography is the climate. Normal annual precipitation over the last 30 years is 46.54 inches. The mean annual snowfall over the last 30 years is 18.3 inches. There has not been any recorded snowfall between the months of May through October. The average annual relative humidity is around 80 percent and the prevailing winds are from the Southwest.

Water resources are also a major contributing factor to the diverse geography in the region. The major surface water feature in the planning area is the Hinkston Creek which flows from south to north. The Greenbriar Reservoir supplies water for the City of Mount Sterling. In addition to the Hinkston Creek, there are four major watersheds, developed primarily from the fault systems in early geologic history. All four watersheds are tributary to the Kentucky River which serves as the northern boundary of Madison County. The four watersheds are as follows: Hinkston Creek, Spencer Creek, Somerset Creek and Slate Creek.

SECTION 3

PHYSICAL CHARACTERISTICS OF THE PLANNING AREA

The final contributing factor to the diverse physical geography in the region is the vegetation and wildlife. The vegetated areas are characterized by upland vegetation which includes white oak, northern red oak, black oak, chestnut, red cedar, yellow poplar, black walnut, ash, maple and white pine. Bottomland vegetation is characterized by pin oak, sycamore, willow and red maple. Besides the wooded plants the area is also home to herbaceous plants to include fescue, bluegrass, orchard grass, clover, Indian grass, ryegrass, dandelions, millet, rushes and cattails. Wildlife species are typical of the humid subtropical climate setting and can be placed in one of three (3) groups including open land wildlife, wood life wildlife, and wetland wildlife. With the reduction in wildlife habitat through extension of farming and residential development, wildlife numbers have declined significantly.

b. Man Made Features

The unique geography in the region is not only a result of the natural diversity previously discussed but also because of the unique man-made features located throughout the planning area. The following is a synopsis and in conjunction with the natural environmental features helps to provide an overview of the overall geography of the planning area.

3. Cities/Communities

The major metropolitan region in the planning area is the City of Mount Sterling. Mount Sterling is the county seat for Montgomery County. Montgomery County is the ninth fastest growing county and Mount Sterling is the forty-third largest city in the State.

Source: Kentucky State Data Center
Projections of Population and Households, v2016

Projected Change in Total Population: 2015-2040								
Rank	Largest Numeric Gain		Largest Percentage Gain		Largest Numeric Loss		Largest Percentage Loss	
1	Jefferson	111,836	Scott	86.5%	Pike	-13,495	Fulton	-36.9%
2	Fayette	105,325	Oldham	52.8%	Floyd	-9,494	Leslie	-29.6%
3	Boone	63,381	Shelby	51.7%	Harlan	-7,379	Breathitt	-29.6%
4	Warren	60,854	Boone	49.6%	Bell	-5,963	Knott	-29.5%
5	Scott	45,325	Warren	49.5%	Letcher	-5,578	Hickman	-28.3%
6	Oldham	34,249	Spencer	45.7%	Perry	-5,376	Lee	-27.5%
7	Hardin	28,462	Jessamine	40.3%	Hopkins	-5,332	Martin	-26.9%
8	Shelby	23,607	Fayette	33.5%	Clay	-5,258	Harlan	-26.6%
9	Jessamine	20,956	Montgomery	32.5%	Greenup	-4,661	Floyd	-25.1%
10	Bullitt	19,543	Hardin	26.7%	Knott	-4,633	Clay	-25.0%

SECTION 3

PHYSICAL CHARACTERISTICS OF THE PLANNING AREA

The city is approximately 3.4 square miles and has approximately 7,278 residents. Mount Sterling is located at 38°3' 21" N 83°56' 32" W and is situated at the foothills of the Appalachian Mountains. Mount Sterling operates under a council-mayor government. The mayor is elected for a term of four (4) years while each of the four (4) council members is elected to a term of two (2) years.

Other communities located within the planning area include the unincorporated communities of Prewitt, Reid Village and Ewington all located in the Mount Sterling Micropolitan Statistical Area. Adjacent communities to the project area include the City of Winchester.

4. Universities/Colleges

Morehead State University's Mount Sterling Campus is located in the City of Mount Sterling. The regional campus, which draws students from seven surrounding counties, features a dedicated state-of-the-art nursing lab and two computer labs. In addition, an Adult Education and Career Center are also located on the campus to provide literacy training and GED preparation courses.

The Montgomery County Cooperative Extension Office is located on Locust Street. The University of Kentucky and Kentucky State University serve as partners in coordinating and conducting educational programs through the Extension.

Maysville Community and Technical College (MCTC) is located near the intersection of Calk Avenue and Levee Road. MCTC offers classes at the Montgomery Extension Office.

5. Primary and Secondary Education Facilities

The Montgomery County School District serves approximately 4,900 students. The system includes three elementary schools, one intermediate school, one middle school, one alternative school and one high school.

6. Hospitals/Medical Clinics

Kentucky One Health of Mount Sterling, formerly Mary Chiles Hospital, became a member of the Saint Joseph Health Care System in August of 2007. The campus is located at the intersection of I-64 and Maysville Street.

SECTION 3

PHYSICAL CHARACTERISTICS OF THE PLANNING AREA

Other medical facilities located in Montgomery County include the following: Pathways Comprehensive Care Center, Montgomery County Health Center, Sterling Meadows Assisted Living, Windsor Care Center Nursing Home, and the Montgomery County Ambulance Service.

7. Library Services

The Montgomery County Library was started in 1871 in the Masonic Lodge. The Library has grown over the years and moved into the current location in 1984. In 2008, the Montgomery County Library opened a branch in the community of Camargo.

8. Airports/Heliports

Montgomery County's only airport, Mount Sterling/Montgomery County Airport is located 2 miles west of Mount Sterling city center. The airport has one 5,000-foot paved runway and a parallel taxiway. Kentucky One Health has one helipad for emergency patients.

9. Commercial Developments

Not including the downtown commercial district, there are three major commercial centers located in the planning area. The northern commercial center is made up of a range of developments including a strip mall. The western area has the Montgomery Square Kroger Shopping Center. The northwest quadrant includes the Gateway Plaza Shopping Center. Shops include Big Lots, CVS Pharmacy, and the Dollar Store.

10. Industrial Developments

The Midland Trail Industrial Park located in the northeastern quadrant of the planning area has 180 acres for industrial development. This is a potential major growth area. According to the 2015 Comprehensive Plan, it is expected that when the Industrial Park is fully occupied it will provide over 2,000 jobs. Woodland Industrial Park was established by the Industrial Authority in 1990 in the northwest quadrant of the US 60/I-64 interchange.

C. Water Quality Objectives



SECTION 3

PHYSICAL CHARACTERISTICS OF THE PLANNING AREA

The Kentucky Natural Resources and Environmental Protection has outlined requirements which apply to Publicly Owned Treatment Works. The Mt. Sterling Comprehensive Plan written by Stephen H. Mooney for the Mt. Sterling Planning Commission sets forth a comprehensive set of community goals, objectives, policies and implementing projects which are consistent with the Kentucky Natural Resources and Environmental Protection requirements set forth in the latest water quality standards.

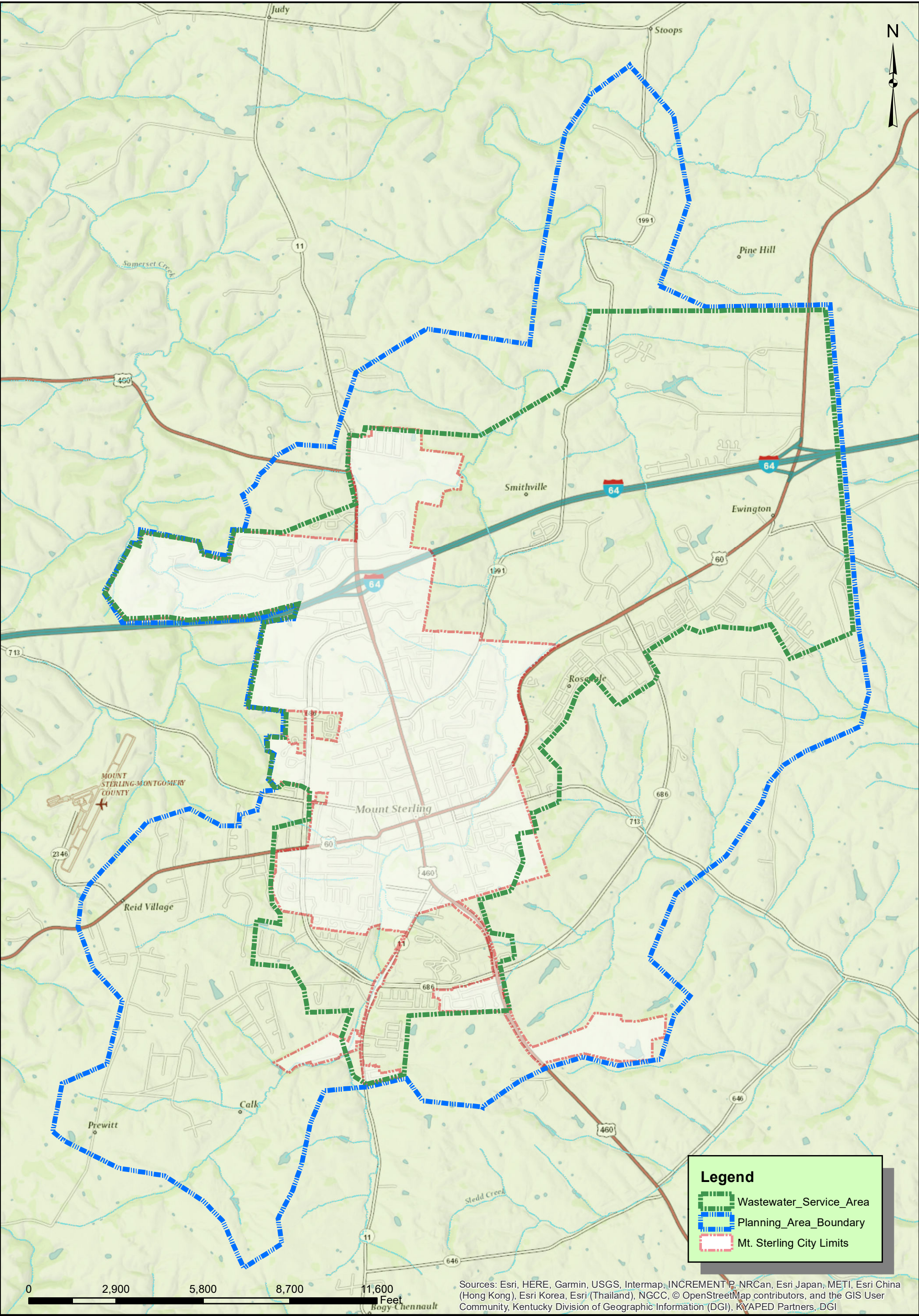
D. Community Goals

The 1992 Comprehensive Plan for Mt. Sterling, Kentucky, outlines a broad array of community goals, objectives principles and policies for the community. These goals serve as a guide for the development and economic and social well-being of the community.

SECTION 3
PHYSICAL CHARACTERISTICS OF THE PLANNING AREA

EXHIBITS

City of Mount Sterling Planning Area (Exhibit 3-1)
Wastewater Collection and Treatment (Exhibit 3-2)
Planning Area Topographic Map (Exhibit 3-3)
Planning Area Flood Hazard Map (Exhibit 3-4)
Planning Area Land Use Map (Exhibit 3-5)

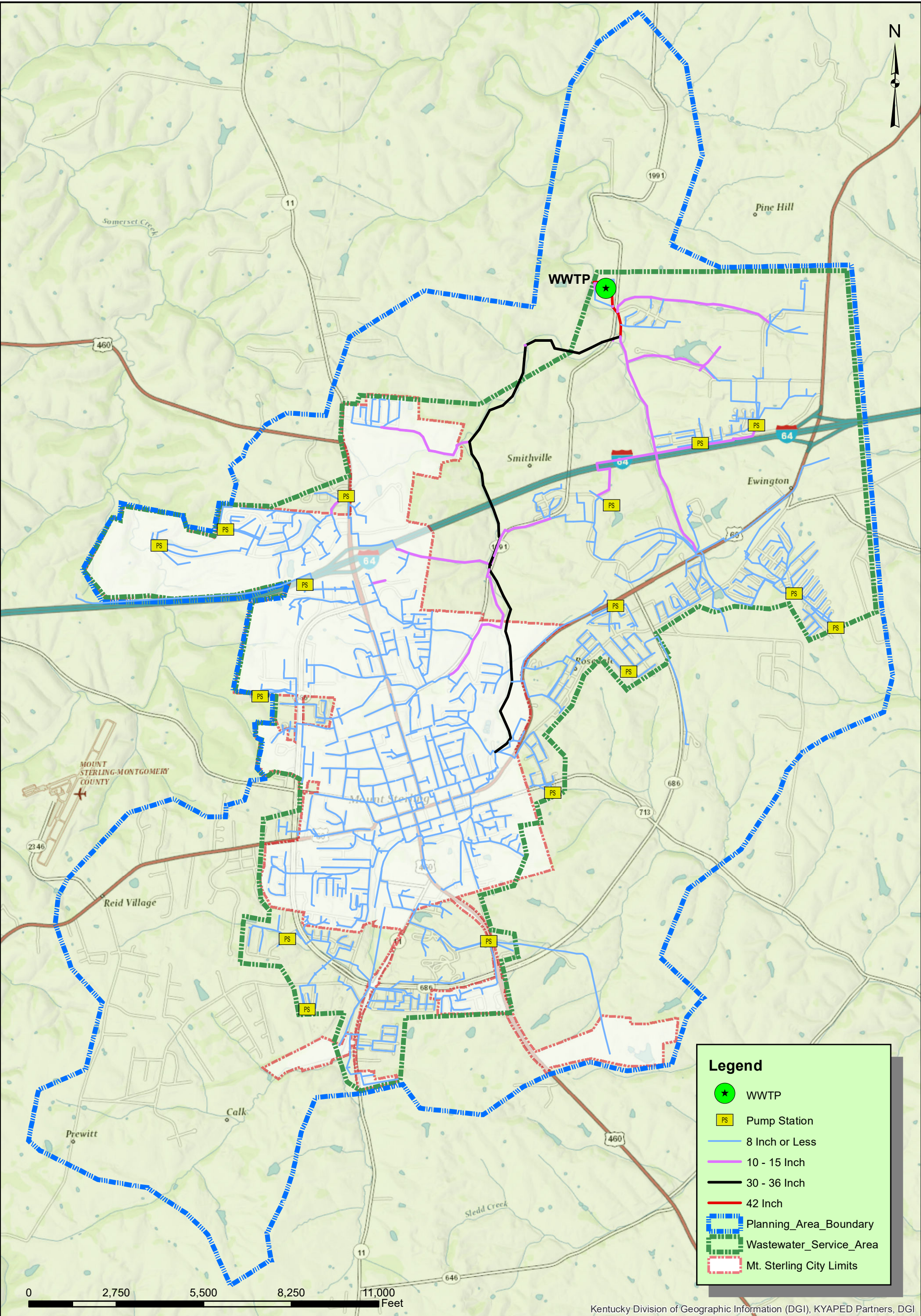


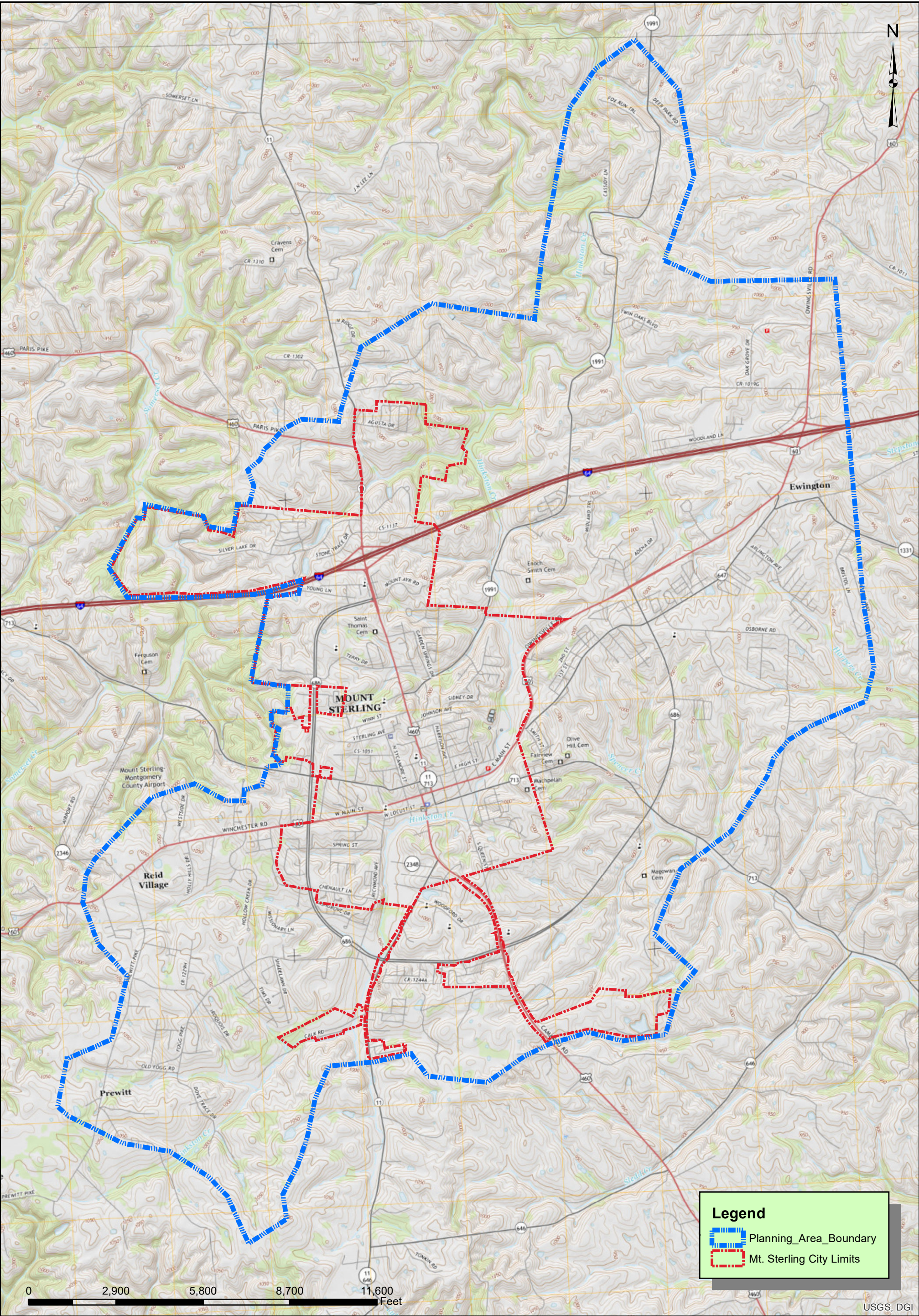
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Drawn:	WTD
Checked:	JTK
Approved:	DFS

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EXHIBIT 3-1
MT. STERLING PLANNING AREA
WASTEWATER FACILITIES PLAN
CITY OF MT. STERLING, KENTUCKY

Scale: 1 inch = 0.55 miles
Sheet: 3-1

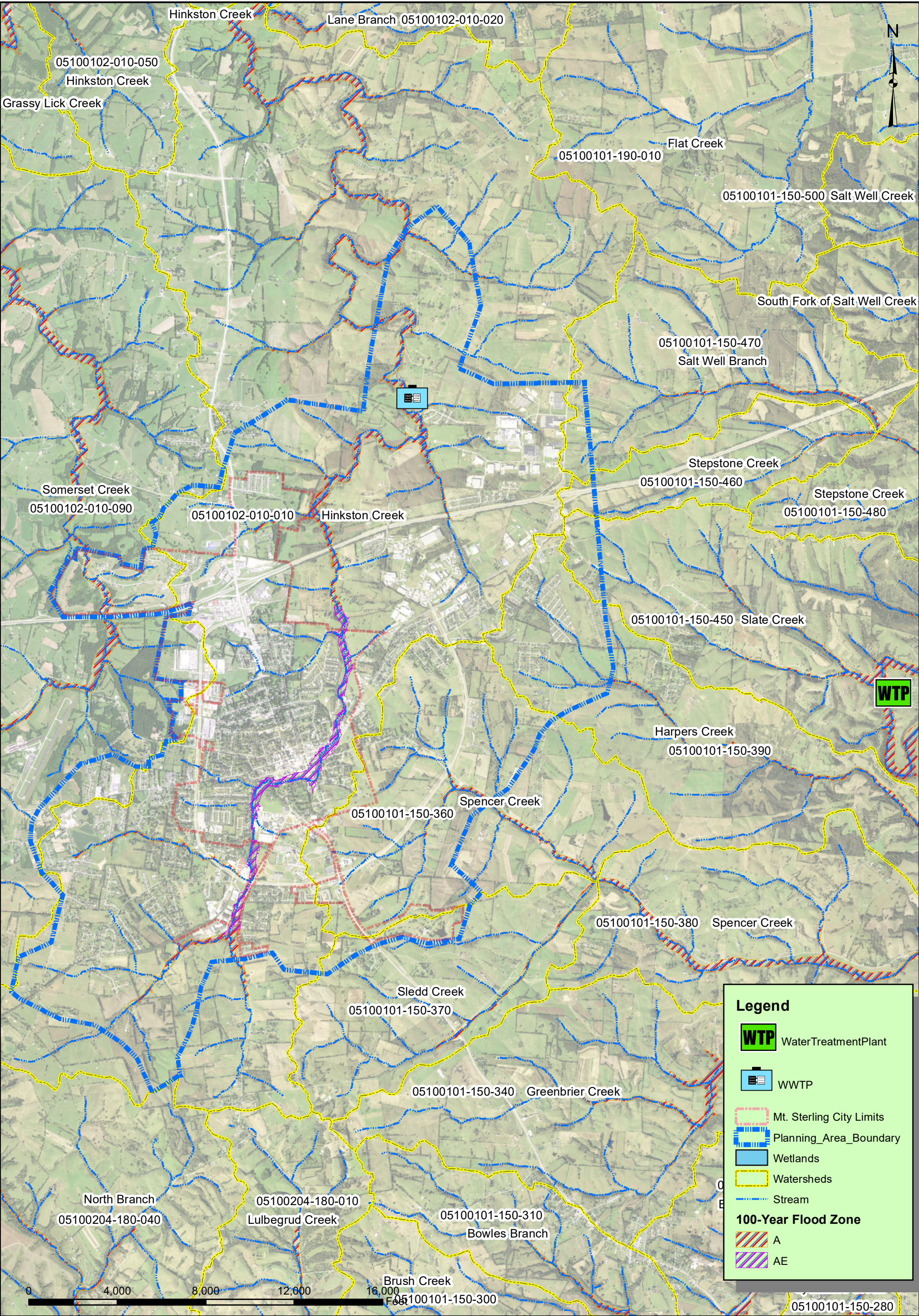


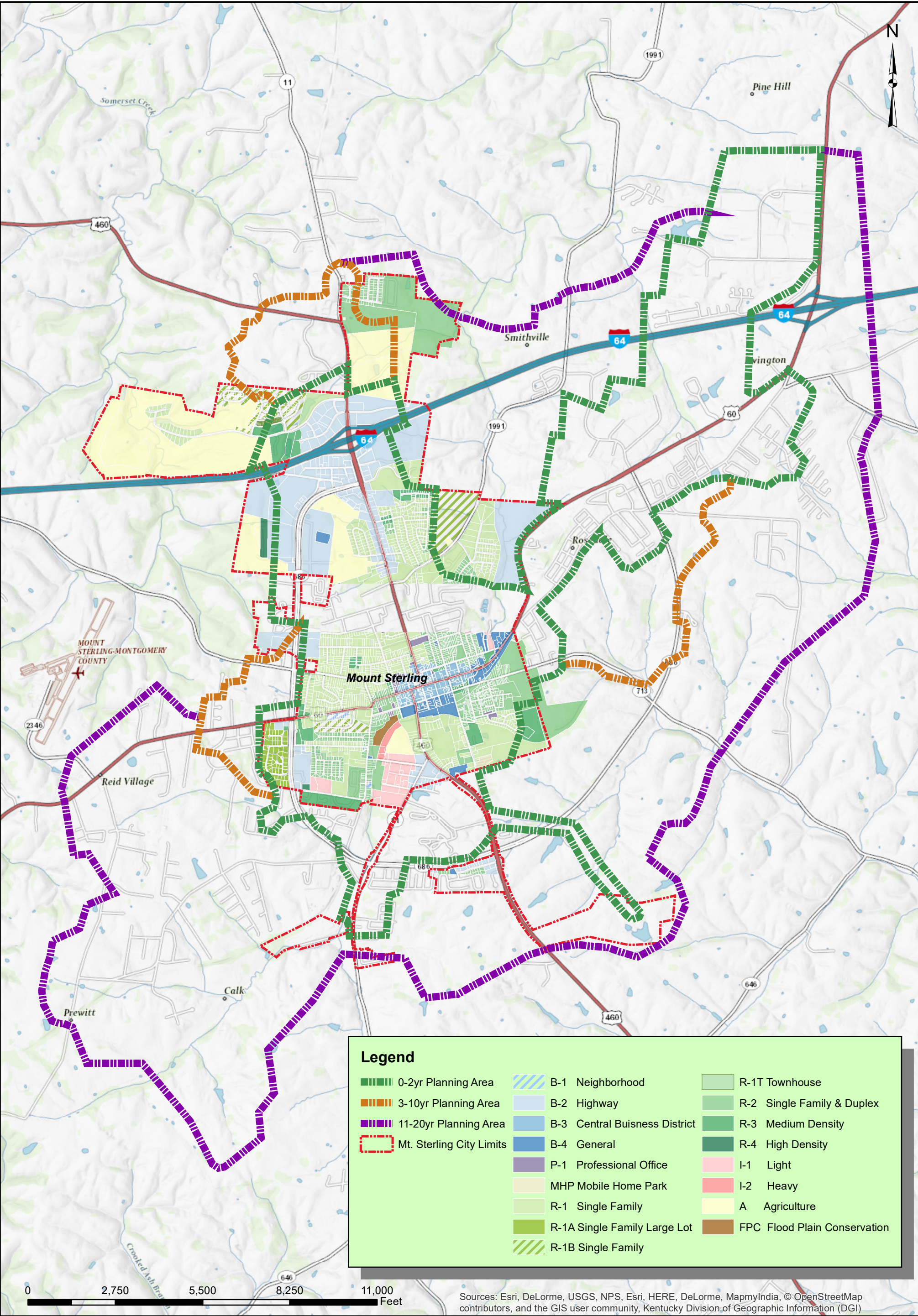


Legend

Planning_Area_Boundary

Mt. Sterling City Limits





Date:	10/2/2019
Drawn:	WTD
Checked:	JTK
Approved:	DFS

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EXHIBIT 3-5
PLANNING AREA LAND USE MAP
WASTEWATER FACILITIES PLAN
CITY OF MT. STERLING, KENTUCKY

Scale: 1 inch = 2,750 feet
Sheet: 3-5